NOVEMBER 1984

SOFTWARE CLUB

NEWSLETTER

Greetings to all Rocketmen! (and Rocketwomen!). From your letters it is obvious that you all thought "FORTY NINER" to be the best thing since the invention of the ZX81 - but the impossible has happened. "ROCKETMAN" has turned out to be even more popular! AND there is another program on the way! (please control yourselves!) Like before it is awaiting its packaging but this time we are not even going to attempt to estimate when it will be available as last time several of you took our guesses literally and wrote some really stinking letters when we were a little inaccurate! However we will say that we hope it will be out in time for Christmas!

In this issue the high score for "FORTY NINER" by P. Millington remains umbeaten but the gap between first and second places has been closed a little. Plus of course the first round of high scores for ROCKETMAN, and something a little more unusual. We now have a claim for the lowest personal best from the player who is all thumbs. Are you even more useless? Is your personal best so low you hide in embarrassment? Well don't! Just tell us and we can all have a good laugh!

We are now receiving so many claims for hi scores with a witnesse's signature as proof, rather than a photograph. So many infact that we cannot ignore them any longer and will from now on be accepting this as official proof. So keep them coming!

The program in this issue is too good to give away. In machine code, it is a must for all ZX81 owners who have got into the habit of taking forty winks while they wait for a program to SAVE or LOAD. We all know that this can take forever (or at least seem to) but not with this program. When used it will SAVE a 16K program (or reLOAD it) in less than a minute!

There seems to be a number of people who are having a slight bit of bother with flying the vulture in ROCKETMAN. Mainly the questions follow the same pattern, "Why doesn't the vulture go up when I press the flap key?, is this a bug?" Inside are full instructions which will make you feel very foolish if you are one of them.

We get down to the nitty gritty in the bit about machine code.

Guess what? Now that the summer has gone you loonies are buying more Cosmic Cockerel T-shirts than you did when the sun was shining. We are therefore including another order form in this issue. Who knows, we shall probably have to double our production if it snows this year!

HALL OF FAME

FORTY NINER	187,864	P. Millington	(Nuneaton)
FORTY NINER	73,029	Stephen Gosney	(Reading)
FORTY NINER	46,682	Jonathon Moakes	(Ambleside)
SUPER SCRAMBLE	31,000	Daniel Foxman	(Glasgow)
ASTEROIDS (LEVEL2)	4,275	J.N. Doyle	(Crawley)
GOBBLERS (LEVEL 2)	26,710	Raymond Greenwood	(Nottingham)
FROG HOPPER	8,640	Richard Benner	(Sheffield)
ROCKETMAN	42,455	Patrick O'Donohue	(Wolverhampton)
ROCKETMAN	21,838	Liam Rogers	(Worcester)

The lowest hi score ever for ROCKETMAN has been sent in by PAUL HODGKINSON of Belfast, with the grand total of 16 after many hours playing. Can you beat that? (or shall I say, can you not beat that?)

HELPLINE

QUESTION

Dear Cosmic Cockerel,

I read with interest the article concerning you in PCW last week.....

Perhaps you can help me out! - Do you know of any incompatibility problems between Alphacom 32 printers and Ram packs other than Sinclair's own? I cannot get my system (Alphacom and Memot ech 64K) to set up in any configuration. Dean Electronics say that the printer is only compatible with Sinclair Products. If you know of a problem and there is a way around it, can you tell me?

John Schofield, Lancs

The answer to this question comes straight from Dean Electronics themselves:-

Registration No. 1203242 ENGLAND

DEAN ELECTRONICS LIMITED

Registered Office GLENDALE PARK FERNBANK ROAD
ASCOT BERKSHIRE SL5 8JB

Tel: WINKFIELD ROW (0344) 885661
Telex: 849242

CST/JH

28th August, 1984

1, Sutton Street,
Feniscowles,
Blackburn,
Lancs.,
BB2 5ES.

For the attention of Mr J. Schofield

Dear Sir,

Thank you for your letter dated 13th August, 1984. The problem you have identified with the Memotech RAM pack can be cured by using the buffering circuit which I am enclosing with this letter.

The printer itself is designed and advertised as a product to be used with standard Sinclair products. Because of the multitude of 'add ons' available which all use different interface hand shakes we cannot guarantee our printer will work with them.

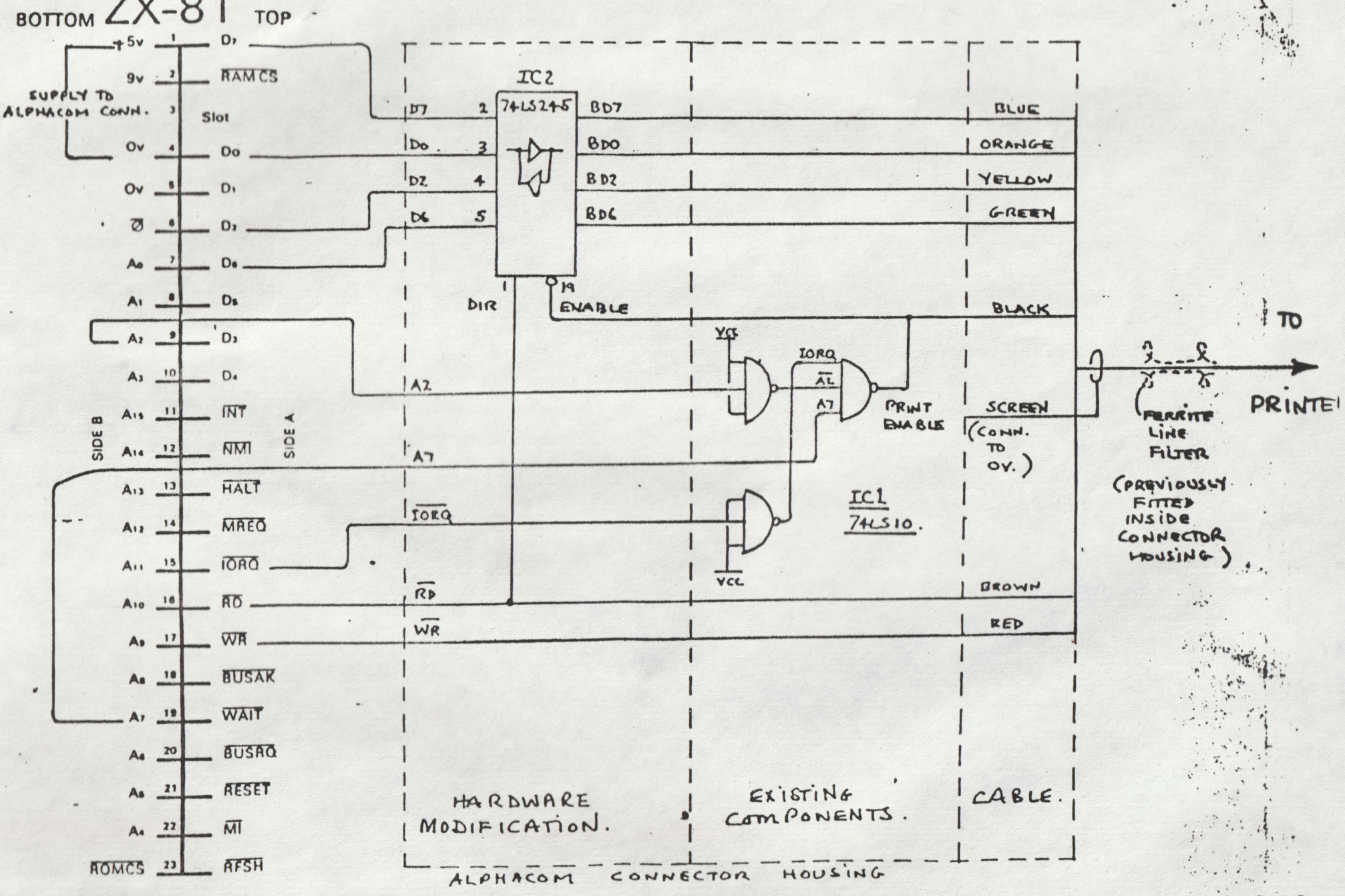
Naturally we are sorry that you are not satisfied with our product and I do remind you that a full refund is available to you should you wish to return the product to the shop where you purchased it.

Yours faithfully,
FOR DEAN ELECTRONICS LIMITED

C.S. Tredinnick
PRODUCT MANAGER

Enc

ALPHACOM 32 DATA BUFFER.



R.W.R.
MAY 1981

ANSWER

If you are a wizard with the soldering iron, and have a few spare parts pinched from your dear old mum's brand new computer controlled washing machine (and of course you have the same problem) this could be your answer. But ..... it seems that the lesson to be learnt from all this is that, if you have an Alphacom 32 printer and a non-standard RAM pack, whether or not you are a wizard with the soldering iron it might be better to exchange your RAM pack for Sinclair's own simply to avoid burning your bridges. Otherwise, once the modification has been made, all certainty concerning the operation of any further Sinclair hardware (or any other for that matter) with your system, goes out of the window. The only alternative might be to take up the money back offer on the printer!

QUESTION

Can anyone throw any light on what happened to BASICARE SYSTEMS. Paul Hodgkinson of Belfast (Yes the one with the amazingly low high score!) is dying to know.

Dear Cosmic Cockerel,

Congratulations on two excellent games for the ZX81. I am of course refferring to FORTY NINER and ROCKETMAN. I have bought both and discarded anything else that I had. More please. You talk about hi-scores, well what about the lowest score, I think I must have that record with the score of 16. These are good games for testing your reactions, me, I don't have any, age is creeping up on me very fast, either that or I need a better joystick.

Now to the serious side of my letter, at present I have a BASICARE SYSTEM on my ZX81, this consists of a personna 16K memory and a sound unit, I would like more units but I have been told that they have gone into liquidation (BASICARE SYSTEMS). Could you or any of your readers tell me if this is true and is it possible still to purchase these units.

The T-Shirts are brilliant I wear it with pride.

Paul Hodgkinson, Belfast

QUESTION

Dear Cosmic Cockerel,

I bought one of your computer games for the ZX81 called FORTY NINER for my sons birthday last weekend. However, he cannot make it work for lack of instructions. After the loading there appear a row of zero's on the screen, nothing else, and there are no details on how to start the game in the box either.

Please could you tell me how and what to do to start this game. I tried to find out in a local computer shop but they were unable to help me.

E. Morris, Devon

No prizes for guessing what the trouble is here. Everyone with a copy of FORTY NINER will know that it doesn't LOAD like that and anyone with a ZX81 should recognise a familiar problem. All together now.....1.....2.....3..... LOADing ERRORS!

However to be fair to new owners (don't forget that although the way the ZX81 is generally treated gives the impression that it is as antiquated as the ark, that it is actually still on sale!) who may not be aware of the reputation the ZX81 gained in its heyday, we have included a sheet of LOADing hints. In case you are a new owner and therefore not aware of the ZX81's murkey past its reputation went something like this, "Marvellous little machine but..... tends to have a mind of its own when it comes to LOADing and SAVEing programs - can work perfectly well at times but it generally depends on which side of the silicon it got out of bed that morning. Also extremely prone to white-outs caused by mains fluctuation and RAM packs wobbling on their connections. Apart from this we all love the dear old ZX81!"

So here are some hints on how to coax the little darling to get up on the right side of the silicon all (well almost) of the time.

TAPE LOADING INSTRUCTIONS

For those new to the ZX81 load your program by entering LOAD "". Now make sure you are at the beginning of the tape and the volume control is set to approx. ¾, press NEWLINE and start your tape recorder playing. Next..... be patient! The first 30 seconds of the tape have not been used as this is where most problems lie, and the program will take 3-4 minutes to load after this. So I suggest you go and make a cup of tea! As long as black lines dance across the screen everything is fine. The program will automatically start once it has loaded and will give you instructions on how to play, so..... GOOD LUCK!!!

TAPE LOADING PROBLEMS

Every care has been taken to ensure that your tape reaches you in perfect condition. However, the otherwise brilliant little computer from Sinclair is notorious for its LOADing problems, so it is more than likely that you will experience some trouble due to this.

Firstly look at the tape recorder you are using. Ideally it should be a machine specifically designed for the storage and retrieval of digital information, but these retail for around £40 - £50 so can come a little expensive. The next best is the reverse of what you might expect - so if you are using a good quality stereo with the ZX81 then throw it away! (well at least) as far as your computer is concerned). Then buy a cheap portable MONO. The ZX81 is designed for use with the signal these produce. Programs are recorded as high frequency pulses separated by short gaps which are simply not present in any musical notes. Better quality equipment tries to 'clean up' the musical notes and signals it receives by trying to fill up these gaps - effectively turning a perfectly good program into meaningless rubbish. Sinclair have compiled a list of approved tape recorders and will send you a copy if you send [illegible]

Secondly, experiment with your machine:

1. Set treble to maximum and bass to minimum (or 'tone' to high).
2. Ensure the leads to the recorder do not cross the lead from the power supply.
3. Clean the heads with cleaning fluid (NOT with a tape).
4. Using a short program for convenience, try loading it repeatedly with gradually increasing volume levels. Start with the volume between ½ and ¾ and increase it a fraction each time until you manage a successful load. If the screen goes blank and the 'K' cursor returns, then the volume is too low. If the computer 'locks out' i.e. the display freezes and it refuses to respond to any key depressions, then the volume is too high. Once you have achieved a successful load, mark the position for future reference.

RAM-PACK WOBBLE

This is the other bug-to-bear of the ZX81, and our games being full of excitement and tension tend to let the poor old computer in for some rough treatment when capture is imminent and sudden evasive action the order of the day, which exaggerates the problem. The symptoms are : at best the sudden appearance of peculiarities in the program like men walking through walls, leaving 'dead bodies' or vanishing forever, or at worst the complete locking of the keyboard. Either way, the only action to take is to pull out the plug and start again.

The permanent cure is to buy a length of ribbon cable, solder one end to the RAM pack and plug the other into your computer, so that all further vibrations are absorbed by the cable. A less permanent, but only slightly less effective way is to place a piece of BLU-TAC just above the connector on your RAM pack and literally stick it to the computer.

YOUR PROGRAMS

*** 1500 BAUD ***

By STEVAN ROBATHAN

For those of you unfamiliar with the term, the Baud rate is the measure of the speed of Data transfer between any compatible components. (i.e. between tape deck and computer or between computer and, say, a printer etc.). The ZX81, just in case you are interested has a Baud rate (between cassette and computer) of 300.

This can be translated as 'painfully slow!' So we are going to up it to 1500 which can be translated as 'Spectrum rate!' So if you want to speed up the LOADing of your home-written programs, it means re-SAVEing them all using Stevan's machine code program, but the result should be worth it.

In the following listings there are two programs in BASIC plus the machine code listing. The first BASIC program simply allows you to enter machine code in hex, exactly as we have listed it. The second BASIC program allows you to SAVE the machine code. Also, once SAVEd it allows you to re-LOAD it and automatically transfers it from lower memory (where any new program would write over it) to above RAMTOP out of harms way, and clears the remaining memory for use.

HERE GOES!

Step 1 Enter line 1 as REM statement containing 244 characters (i.e. type '1 REM' followed by any character, say a '0', 244 times) this is where the machine code is going to go.

Step 2 Type 'POKE 16510,0'. This changes line 1 (your REM statement) to line 0 so it cannot be erased, altered or written over.

Step 3 Enter BASIC program one and RUN it. Once run, your ZX81 will expect a string input (i.e. a mixture of numbers and letters) So you will see a blank screen with just the cursor in the lower left hand corner.

Step 4 Enter the hexadecimal EXACTLY as listed. To avoid errors it will probably be easier to type in one complete line at a time, i.e. you would type CD230F11067FCD2B and then press NEW LINE. The address each code has been poked into will appear alongside the code itself and then it will wait for further input.

Step 5 After you have entered the last line (do not worry because it is shorter than the rest - simply enter it in the same way). Enter "S" and you will leave this program. (As a check the last address printed on the screen should be 16757)

Step 6 Delete the BASIC program by typing in each line number and pressing NEW LINE. Any other way will delete the machine code as well as the BASIC.

Step 7 Type in BASIC program TWO. You are now ready to SAVE this program so set up your tape recorder.

Step 8 Start tape recording and RUN program. It will SAVE itself automatically and then move the machine code above RAMTOP, ready for use.

REMEMBER: When you intend to use this program to SAVE a program you are about to write, it must be LOADed in BEFORE you start writing otherwise it will overwrite all your hard work, and obviously it must be LOADed in before you re-LOAD something

previously SAVE'd using this system.

TO USE: Once this program is safely sitting above RAMTOP you may use the lower memory in the normal way for writing, SAVEing or LOADing programs (except very long ones when there would not be room for both programs).

TO SAVE USE: RAND USR 32512
TO LOAD USE: RAND USR 32525

Note: Only programs previously SAVE'd using this system can be LOADed in this way.

PROGRAM 1

THE HEXLOADER PROGRAM

```
 0 REM (244 Characters)
10 LET N=16514
20 LET R$=""
30 IF R$="" THEN INPUT R$
40 SCROLL
50 PRINT N,R$( TO 2 )
60 POKE N,16*CODE R$+CODE R$(2)
70 LET N=N+1
80 LET R$=R$(3 TO )
90 GOTO 30
```

THE MACHINE CODE

```
CD  23  0F  11  06  7F  CD  2B
7F  CD  2B  0F  C9  CD  23  0F
21  1D  7F  22  16  40  CD  70
7F  CD  2B  0F  C9  0B  0B  0B
00  00  00  00  00  00  CD  A8
03  38  F9  EB  11  CB  12  CD
46  0F  30  2E  10  FE  1B  7A
B2  20  F4  CD  4E  7F  CB  7E
23  28  F8  21  00  40  CD  4E
7F  CD  FC  01  18  F8  5E  37
CB  13  C8  9F  E6  02  C6  01
4F  D3  FF  06  23  10  FE  CD
46  0F  30  72  06  1E  10  FE
0D  20  BE  C3  D8  7F  18  E0
CD  A8  03  CB  12  CB  0A  CD
7C  7F  18  FB  0E  01  06  00
3E  7F  DB  FE  D3  FF  1F  30
49  17  17  38  28  10  F1  F1
BA  D2  E5  03  62  6B  CD  7C
7F  CB  7A  79  20  03  BE  20
D6  23  17  30  F1  FD  34  15
21  09  40  50  CD  7C  7F  71
CD  FC  01  18  F6  D5  1E  31
06  0E  1D  DB  FE  17  CB  7B
7B  38  F5  10  F5  D1  20  04
FE  56  30  B2  3F  CB  11  30
AD  C9  7A  A7  28  BB  CF  0C
A7  06  50  10  FE  C3  6E  7F
21  82  40  11  00  7F  01  E0
00  ED  B0  21  FF  7E  22  04
40  C3  C3  03
```

PROGRAM TWO

LIST 2

```
 0 REM (machine  code)
 1 REM (C) S.ROBATHAN 1984
10 PRINT"SET UP TAPE AND START
RECORDING"
20 PAUSE 100
30 SAVE"1500 BAUD"
40 PRINT"1500 BAUD"
50 PRINT"PRESS A KEY TO PUT M/C
ABOVE RAMTOP AND CLEAR THIS PROGRAM..."
60 PAUSE 4E4
70 RAND USR 16738
```

YOUR COMMENTS

If you are one of those ROCKETMEN who, having leapt onto the vulture, unceremoniously dives straight into the water despite pressing the 'flap' key with all your might - then prepare to feel a right fool! AND if you are one of those who have written to suggest that this is a bug in the program rather than anything to do with your playing then wash your mouth out with soap and water!

Here are some hints which may help you remove those vulture flying "L" plates! The vulture in ROCKETMAN is designed to be as realistic as possible and will rise a little for each flap of its wings, just like a real bird.

Imagine, if you will, a little blackbird who launches himself off the top of a high building and very soon finds himself approaching the ground face first at a very high rate of knotts.

"FLAP" his mum shouts at him from the top of the building

"What?" he replies, unable to hear because of the wind rushing past his ears.

"FLAP YOU TWIT!!"

"Oh yeah! I never thought of that!" he says and manages two flaps before piling himself into the ground.

The moral of this story is that the more you flap the vultures wings the better it flies. As soon as you press the jump key the vulture

Once you release the key they will return to the up position ready for another go. So the faster you press and immediately release the 'jump' key the higher the vulture will fly.

FLAPPY HAPPING.....er.....HAPPY FLAPPING!

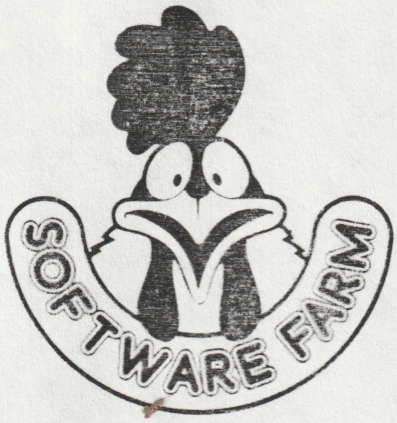
Brian Rafferty of Paisley has the following question to ask:-

I wonder if any of the readers of this newsletter would be interested in a cassette tape "Magazine" for the ZX81 which I am thinking of starting if sufficient interest is shown.

For further information please write to:-

Brian Rafferty
1 Rosedale Avenue
Paisley
PA2 0RR

MACHINE CODE



As it has been some time since the last issue lets refresh your memory of the ground we've covered so far.

C.P.U. = Central Processor Unit
R.O.M. = Read Only Memory
R.A.M. = Random Access Memory
BIT = Binary DigIT
BYTE = A group of 8 Bits
ADDRESS = Position of a given Byte in a memory

We know that the C.P.U. is the 'Brain' of the computer, the part in which all the weird and wonderful computations go on that all seem so mysterious. In this issue we are going to have a look inside this Chip and discover that it is not as mysterious as it seems.

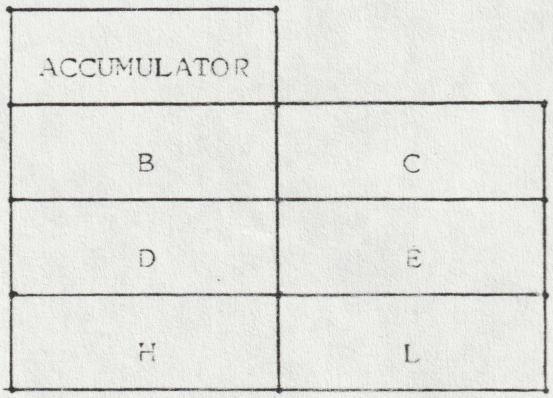
Having read the last issue we now know that a Byte is a collection of 8 Bits and you should have calculated that the maximum number that this can represent is 255 (decimal).

R.O.M. and R.A.M. are simply sequential collections of Bytes, the difference between the two being that R.O.M. is read

Only and is therefore used to store programs, Data etc. that are permanent and not to be written over and also remain in memory once the power has been switched off. The program to run the BASIC language itself is usually stored in R.O.M. for just these reasons.

I have mentioned in the past that inside the C.P.U. there is a program counter which starts at Ø on power up and controls the sequential operation of a machine code program. It reads in the Byte at Address Ø and increments (adds one to) the program counter. It is the Bit pattern in this Byte read in that gives the C.P.U. its instructions. Once the instructions indicated by each particular Byte have been implimented the next Byte is read in, nad so on until the sequence is interrupted. So far so good, but what sort of instructions and how are they used in a program?

In order to answer that question we'll have a closer look inside the C.P.U. Inside, and available to the programmer are a number of Bytes in which data can be moved around to or from memory, or manipulated mathematically. They are called Registers, and some have specific purposes. For instance, probably the most important register of all is the A register (for Accumulator) which is used to perform mathematical functions. All registers form pairs, to allow 16 Bit numbers to be manipulated if necessary, but can also be used singly. The main registers available are:-



After the A Register they have been called B,C,D and E probably due to a lack of imagination. However we suddenly jump to H and L which stands for High and Low. This is because B+C and D+E as well as H+L can be used together as register pairs, and if so used, H would become the High Byte and L the Low (similarly B and D would become the High Bytes in their pairs with C and E as the Low Bytes).

So what sort of instructions are we likely to be able to use, and what effect will they have on these registers? Well the instructions fall into groups, depending on their effect. If you turn to page 125 (APPENDIX A) in the back of your ZX81 Basic Programming book you will find a listing under the heading 'The Character Set'. This is going to be your Bible from now on!

GROUP 1 Any register can be loaded directly with a number i.e. to load the register B with the number 8 the instruction would be 06 08. Look down the middle column marked 'HEX' for the number 06 and you will find that this represents LD B,N according to the column marked 'Z80 Assembler'. This is the mnemonic for

LD B,N

LoaD register B, with Number

The number required is assumed to be in the following Byte, hence Load B with the number 8 is 06 08.

GROUP 2 Any register pair can be loaded directly with a number. For instance load the register pair BC with the number 10 would be 01 0A 00. You will find the mnemonic reads LD BC,NN, where NN denotes that two Bytes of data are to follow, one for each Byte in the register pair. Two things might need clarifying. Firstly I hope you have realised that 0A is hexadecimal notation for 10, and secondly the number appears to be written backwards. In actual fact it IS written backwards! In all cases in the Z80 processor it is the lowest Byte which is read in first and so all numbers must be written backwards. This is an important point to remember.

GROUP 3 Only the accumulator, alone or any Register pair can be loaded with the contents of a specified location. In the case of the accumulator the command would be:

3A 00 00

Where the two Bytes following the command would hold the address from which the data was to be taken. If you look up 3A in your hex table the corresponding mnemonics read:-

LD A,(NN)

The brackets distinguish the NN from being a direct number, indicating that it represents an address. (Don't forget that such an address will always be written with the Low Byte first). Similarly, Load HL with the contents of memory location 32 would be:

2A 20 00

In this case L would be loaded with the contents of Address 32 (remember Low Byte first) and H will be loaded with the contents of Byte 33.

GROUP 4 The HL pair has the specific function of being used as an index register. This means that it can be used as a pointer into memory to transfer the contents of any register in either direction. For instance mnemonic:

LD (HL), B

Means: Load the contents of Register B into the Address pointed to by the HL register pair.

Conversely:-

LD B, (HL)

Means: Load the register B with the contents of the memory location pointed to by HL.

GROUP 5 Any register can be loaded with the contents of any other register. See the mnemonic corresponding to the hex command 40 onwards!

GROUP 6 Any register pair can be added to the contents of HL (with the result residing HL) or any single register can be added to the accumulator, the result being in the accumulator.

Obviously these are not all the possibilities by any means- but why go on confusing the issue when you are probably screaming with frustration,

"O.K. so I can change the contents of a register with another but why should I want to! What good is it to me?"

So to illustrate let us write a very short machine code program that will actually do something (not very exciting - but better than a load of hot air!) and will demonstrate some of the uses covered so far.

You all know that you don't always have to use the PRINT statement in BASIC, but can simply POKE the code you require straight into the display file. The problem is keeping track of the display file which is always placed after the BASIC program and therefore moves about as you add or delete program lines. At least Sinclair conveniently has a two Byte variable which stores the current position of the display file (at 16396-7). So the Basic line:-

POKE 256* PEEK 16397 + PEEK 16396 + 412,128

will calculate the current position of the display file, add 412 to it giving us a position somewhere about the centre and POKE 128 into the position. 128 is the code for an inverse blank, so giving a black square in the middle of the screen.

Let us do the same thing in machine code:-

First we can load the HL register pair with the start of the display file. So we load it with the contents of Address 16396 (and 16397)

2A ØC 40 LD HL, (16396)

Now we want to add our offset into the display file to this address. so we load DE with the number 412 directly.

```
11 9C 01          LD DE, 412
```

and add this to the address stored in HL

```
19                ADD HL,DE
```

Now we want to load this current address with the number 128, being the position in the display file we want.

```
36 80             LD (HL),128
```

Having completed our highly exhilerating task we want to return to BASIC.

```
C9                RET.
```

So the finished program looks like this:-

```
2A 0C 40          LD HL, (16396)
11 9C 01          LD DE, 412
19                ADD HL,DE
36 80             LD (HL),128
C9                RETURN
```

If you wish to type this into your computer, type:-

```
 1 REM 0123456789
10 LET A$=""
20 FOR A=16514 TO 16523
30 IF A$<>"" THEN GOTO 70
40 INPUT A$
50 SCROLL
60 PRINT A$
70 POKE A,16x(CODE A$-28)+CODE A$(2)-28
80 LET A$=A$(3 TO )
90 NEXT A
```

'RUN' it and enter the hex as written. Then use RAND USR 16514 to get the wonderful sight of a black blob being printed by machine code. The excitement must be so great I think I'll need to sit down while I watch!

I'll leave you now with the thought that the best way to learn is by practical experience (and in many cases trial and error!) So in the next issue we shall embark upon a fully fledged machine code program. In the mean-time try experimenting with the program we have just used. Put something other than a black square on the screen.....put it in a different place. The more you experiment the more you will understand!

PRESS RELEASE!

The next program in the hi-res series is to be called Z-XTRICATOR. It is a slight departure from 'FORTY NINER' and 'ROCKETMAN' in as much as it is a 'Shoot 'em up' type game. It seems that you have all been itching for something along those lines, as your letters show, it has been produced by popular request.

I suppose you are going to want to hear a few more details about this new program? Well as I have already said, its more of a shoot 'em up type of game where unlike the other two hi-res programs you actually get to blast things out of the sky. What happens is this ("Ugh", he grunts, his hand clutching at his heart). What was I saying? Oh yes Z-XTRICATOR. Well you see you take on the role of ("Aaah!" he yells, his grip tightening with the pain)..... you take on the role of ..... ("Uuuuugh!" he groans as slowly he slides down the wall and lies motionless in a crumpled heap on the floor).

I'm sorry we have to interrupt this program as our presenter has just collapsed. If you can tell me what he was talking about I might be able to continue for him. So go on.....tell me.

Pardon? You'll have to speak up.
Pardon? I can't hear you
Pardon? Look it's no good I simply can't hear you - we'll just have to leave it here. Good bye.

I don't know why I bother to mention it, as its hardly news anymore - but you will have found an 'I love Cosmic Cockerel' badge enclosed with this newletter. Wear it with pride! Let all those Spectrum owners know you have an '81 and are running software that can knock spots off some of the stuff they have to put up with!

BACK PAGE

For a miniscule charge of 50p we can display any items for sale to an audience comprising entirely of ZX81 owners. In this issue we have the following item for sale from Jonathon Moakes.

MAZOGS (BUG BYTE) £5.00

Send cheque or postal order to us care of Cosmic Cockerel.

All items advertised are from private individuals and are not part of a business. We take every care to ensure that any programs submitted for sale are original copies in the manufacturers original packaging.